



## ***Loboschiza* Diakonoff (Lepidoptera: Tortricidae) from Thailand with descriptions of four new species**

SURACHET ANAN<sup>1</sup>, PARADORN DOKCHAN<sup>1</sup> & NANTASAK PINKAEW<sup>1,2,3</sup><sup>1</sup>Department of Entomology, Faculty of Agriculture at Kamphaeng Saen, Kasetsart University, Kamphaeng Saen Campus, Nakhon Pathom, Thailand, 73140 (e-mail: [surachet\\_jay5@hotmail.com](mailto:surachet_jay5@hotmail.com), [rdipdd@ku.ac.th](mailto:rdipdd@ku.ac.th)).<sup>2</sup>Center for Advanced Studies in Tropical Natural Resources, NRU-KU, Kasetsart University, Chatuchak, Bangkok, 10900, Thailand (e-mail: [agrnsnp@ku.ac.th](mailto:agrnsnp@ku.ac.th)).<sup>3</sup>Corresponding author

### **Abstract**

Four new species of *Loboschiza* Diakonoff collected from the Nakhon Ratchasima, Chanthaburi, Nakhon Nayok, Sa Kaeo, Nakhon Si Thammarat, and Nakhon Pathom provinces of Thailand are described: *Loboschiza spiniforma* Anan and Pinkaew, **n. sp.**; *Loboschiza bisulca* Anan and Pinkaew, **n. sp.**; *Loboschiza subrectangula* Anan and Pinkaew, **n. sp.**; and *Loboschiza lunata* Anan and Pinkaew, **n. sp.** *Loboschiza koenigiana* (Fabricius) is redescribed. Illustrations of adults and genitalia are provided.

**Keywords:** Enarmoniini, morphology, new species, Olethreutinae, *Rhadinosclops*

### **Introduction**

*Loboschiza* was described by Diakonoff (1968) with *Loboschiza clytocarpa* (Meyrick, 1920) from the Philippines as the type species. *Rhadinosclops* was described by Obratzsov (1968) with *Pyrallis koenigiana* as the type species, and it subsequently was synonymized with *Loboschiza* by Diakonoff (1982). The genus is characterized by conspicuously colored forewings, usually with a two-toned pattern with the basal one-half to two-thirds either bright yellow, orange, or with bright red bands on a greyish or brownish ground, and the distal portion darker, brownish or blackish, often with bright orange sinuous striations. Brown (2005) listed three species in *Loboschiza*: *L. clytocarpa* (Meyrick, 1920), *L. halysideta* (Walsingham, 1900), and *L. koenigiana* (Fabricius, 1775). Horak (2006) included 12 species in *Loboschiza* and synonymized two with *L. mediana* (Walker, 1866) (Gilligan *et al.*, 2014). Currently, the following 12 species are assigned to *Loboschiza*: *L. cinnabaritis* (Meyrick, 1928); *L. clytocarpa* (Meyrick, 1920); *L. delomilta* (Turner, 1946); *L. deloxantha* (Turner, 1946); *L. exemplaris* (Meyrick, 1911); *L. furiosa* (Meyrick, 1921); *L. halysideta* (Walsingham, 1900); *L. hemicosma* (Lower, 1908); *L. koenigiana* (Fabricius, 1775); *L. martia* (Meyrick, 1911); *L. mediana* (Walker, 1866); and *L. thoenarcha* (Meyrick, 1911) (Gilligan *et al.*, 2014). The genus is found in Australia, Papua New Guinea, Indonesia, Philippines, China, Thailand, Myanmar, and India (Gilligan *et al.* 2014). In Thailand, *Loboschiza koenigiana* was first reported from the Agroforestry area at Trat Agroforestry Research and Training Station, Trat Province (Tavonprasert *et al.* 2013). Here we describe four additional species from Thailand based on material collected in Khao Yai National Park, Khao Nan National Park, Khao Khitchakut National Park, Pangsida National Park, and Sakaerat Environmental Research Station. We also redescribe *L. koenigiana* to clarify and contrast the descriptions of the new *Loboschiza* species with the same forewing pattern.

### **Materials and Methods**

This study is based on specimens in the Kasetsart Kamphaeng Saen Insect Collection (KKIC). Adults were

photographed with a Canon DSLR 5D mark II and 100 mm macro lens. An Olympus SZ51 stereomicroscope was used for examining and measuring specimens; an Olympus CH2 compound microscope was used to examine genitalia preparations; a Leica DM750 connected with an ICC50 HD camera module was used to photograph genitalia; and the genitalia photographs were customized with Adobe Photoshop. Forewing length was measured from the outer edge of the tegula at the wing base to the outermost edge of the fringe scales at the apex. Genitalia preparation methods were adapted from Common (1990). Terms for forewing pattern and genitalia structures follow Horak (1991, 2006). The following abbreviations are used for depositories: KKIC, Kasetsart Kamphaeng Saen Insect Collection, Nakhon Pathom, Thailand; and THNHM, Thailand Natural History Museum, Pathumthani Province, Thailand.

## Results

### *Loboschiza koenigiana* (Fabricius, 1775)

Figs. 1, 2, 9, 14

*aurantiana* Pryer, 1877 (*Hemerisia*), Cist. Ent. 2: 235. TL: China. Chekiang, Shanghai. Holotype: female (BMNH).

*delectana* Snellen, 1902 (*Grapholitha*), Tijdschr. Ent. 44(1901): 72. TL: Indonesia. Java, Tegal. Syntypes: 3 specimens, sex unknown (NCB).

*koenigiana*; Fabricius, 1787 (*Pyalis*), Mantissa Insectorum 2: 237. Misspelling.

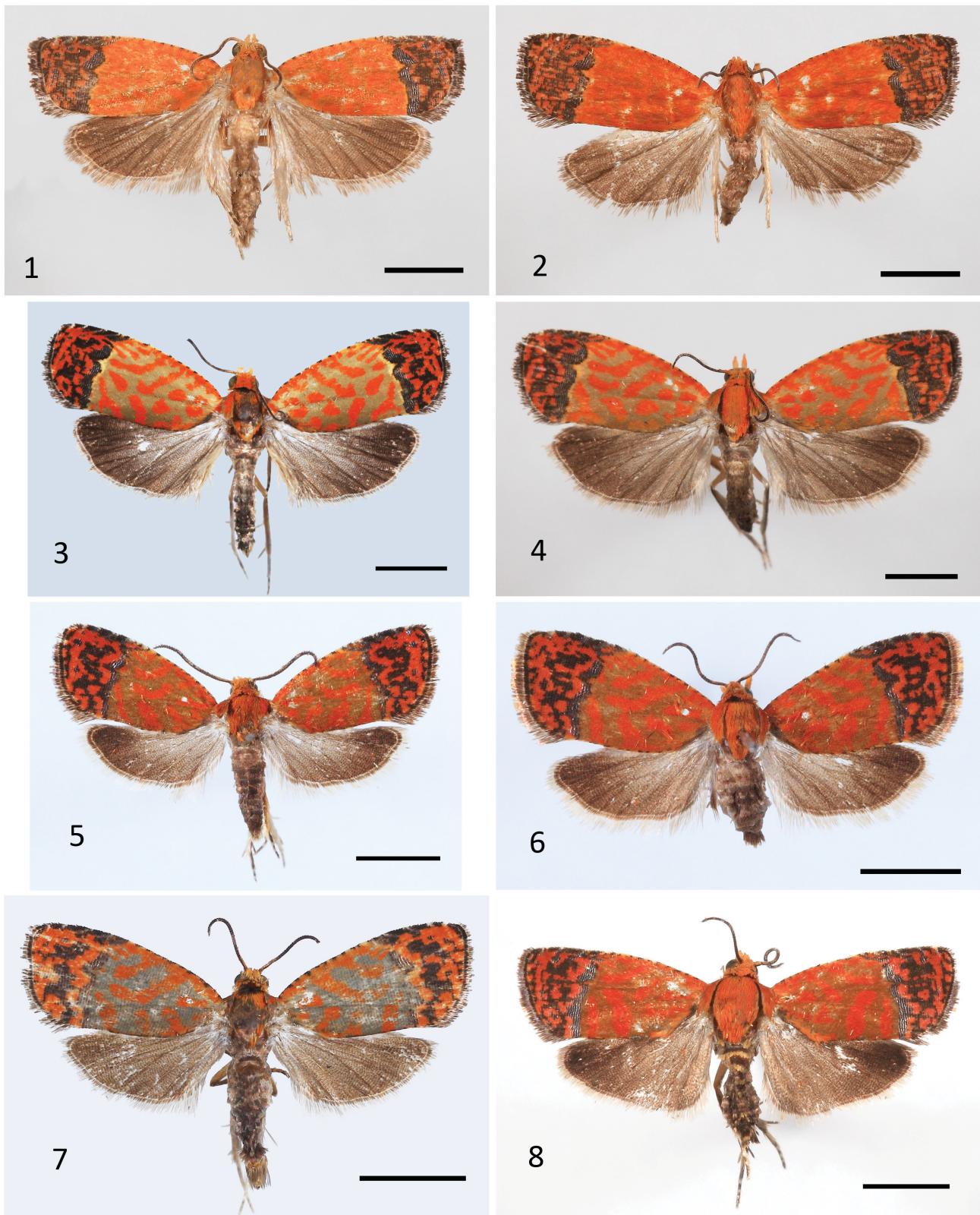
*vulnerata* Walsingham, in Swinhoe, 1900 (*Eucelis*), Cat. East. and Aust. Lepid. Heterocera 2: 571. TL: India. Burma [Myanmar] (Tenasserim). Holotype: sex unknown (OUM).

**Diagnosis.** The wing pattern of *L. koenigiana* is most similar to that of *L. bisulca*, but the width of the forewing is narrower than in *L. bisulca*. The basal two-thirds has weakly contrasting, broad orange bands on a yellowish brown ground color that have greater contrast than that of *L. bisulca*. The male and female genitalia of *L. koenigiana* differ from those of other *Loboschiza* by the cucullus shape, with the ventral process long and narrow, nearly finger-like, with a bipronged thorn at the apex in male, and with a long sclerotized plate in ductus bursae in the female.

**Redescription.** Head: Upper frons and vertex yellowish orange, lower frons light yellow; labial palpus porrect, first segment yellowish orange, second segment distally strongly widened, yellowish orange, with small blackish spots dorsodistally, third segment small, pointed, yellowish orange. Antenna short, not reaching middle of forewing, dark brown, dorsally with a distinct, narrow band of yellowish orange scales basally.

Thorax: Pronotal collar, tegulae and mesonotum light brown mixed with orange; hindlegs with modified tibia, expanded, covered with dense scales and with a white tibial pencil. Forewing subrectangular, length 4.9–5.1 mm in male (n = 5) (Fig. 1), 4.9–5.0 mm in female (n = 2) (Fig. 2), termen slightly oblique, costal margin with well developed, small blackish striae, two-toned wing pattern with basal 2/3 with weakly contrasting broad orange bands on yellowish brown ground, distal portion with blackish ground color with slender orange sinuous scribbles, separated from rest of wing by a transverse leaden band. Underside greyish brown, with white spots along costa and termen. Hindwing light brown, anal margin basally with dense hair tufts in male, light brown. Underside pale brown.

Abdomen: Male genitalia (Fig. 9) with tegumen subtriangular, with pointed process at apex, moderately sclerotized, lateroapically with dense scale sockets on anterior surface; uncus absent; socii rather small, distally free, pendulous membranous lobes, with moderately dense bristles; gnathos two lateral arms, moderately sclerotized, arising from middle of tegumen; vinculum moderately sclerotized; juxta small; caulis moderately long; phallus moderately long, wide at base and slightly narrowing to apex, slightly curved medially, with numerous, dense deciduous cornuti; valva moderately sclerotized, hook-shaped; sacculus rather large, evenly rounded, densely setose, with long loose spines towards neck; cucullus with dorsal portion elongate ovate, rounded at apex, densely setose, with long, very narrow, nearly finger-shaped ventral process, with a bifurcate thorn at apex. Female genitalia (Fig. 14). with papillae anales bearing dense setae. Tergum VIII smooth except for lateral subtriangular extensions with group of scale sockets; sternum VII moderately sclerotized, with moderately dense scale sockets, denser near posterior margin, with subtriangular to rounded projecting lobe medially; ostium bursae behind posterior margin of sternum VII; lamella postvaginalis with dense microtrichia; colliculum an irregular ring, moderately long and sclerotized; ductus bursae as long as corpus bursae, irregularly widening towards corpus bursae, sclerotized apart from narrow membranous ring below colliculum; ductus seminalis arising near neck of ductus bursae; corpus bursae large, ovate, signum a depressed area of scobination near neck of corpus bursae.



**FIGURES 1–8.** Adults of *Loboschiza* spp. (scale bars = 2 mm). **1.** *L. koenigiana* (male), Nakhon Pathom. **2.** *L. koenigiana* (female), Nakhon Pathom. **3.** *L. spiniforma*, **n.sp.** (holotype male), Chanthaburi. **4.** *L. spiniforma*, **n.sp.** (paratype female), Sa Kaeo. **5.** *L. bisulca*, **n.sp.** (holotype male), Nakhon Nayok. **6.** *L. bisulca*, **n.sp.** (paratype female), Nakhon Nayok. **7.** *L. subrectangula*, **n.sp.** (holotype male), Nakhon Ratchasima. **8.** *L. lunata*, **n.sp.** (holotype male), Nakhon Si Thammarat.

**Specimens examined.** 1♂, 1♀, Thailand, Nakhon Pathom Prov., Kasetsart University Kamphaeng Saen, 14°02'17"N, 99°58'11"E, ca. 10 m, 9 May 2005, S. Wisarut, np 1147, ♂ genitalia slide NP 2591, S. Wisarut, np 1149, ♀ genitalia slide NP 2592. 2♂, 1♀, Nakhon Ratchasima Prov., Sakaerat ERS., 14°29'47"N, 101°54'59"E, ca. 514 m, 20 Mar 2015, N. Pinkaew, np 7599, ♂ genitalia slide NP 2558, Sakaerat ERS., 14°30'27"N, 101°55'45"E, ca. 400 m, 21 Mar 2015, N. Pinkaew, np 7612, ♀ genitalia slide NP 2566, Sakaerat ERS., 14°30'33"N, 101°56'16"E, ca. 363 m, 29 Feb 2014, N. Pinkaew, np 6900, ♂ genitalia slide NP 2362. 1♂, Chanthaburi Prov., Khao Khitchakut N.P., 12°48'37"N, 102°09'11"E, ca. 92 m, 6 Jun 2013, N. Pinkaew, np 5838, ♂ genitalia slide NP 1979. 1♂, Chiangmai Prov., Doi Suthep-Pui N.P., 18°48'54"N, 98°55'38"E, ca. 697 m, 1 Apr 2014, N. Patibhakyothin, np 6395, ♂ genitalia slide NP 2253. Deposited in KKIC and THNHM.

**Comments.** The previously proposed (e.g., Brown 2005) synonymy of *aurantiana* Preyer, *delectana* Snellen, and *vulnerata* Walsingham with *koenigiana* was not revisited by us, but it is accepted here. The syntypes of *L. koenigiana* from India are unknown and hence unavailable for study (Brown 2005). External appearance and the genitalia of both sexes of Australian and Thai specimens indicate that the material is conspecific, at least in these two countries.

***Loboschiza spiniforma* Anan and Pinkaew, n. sp.**

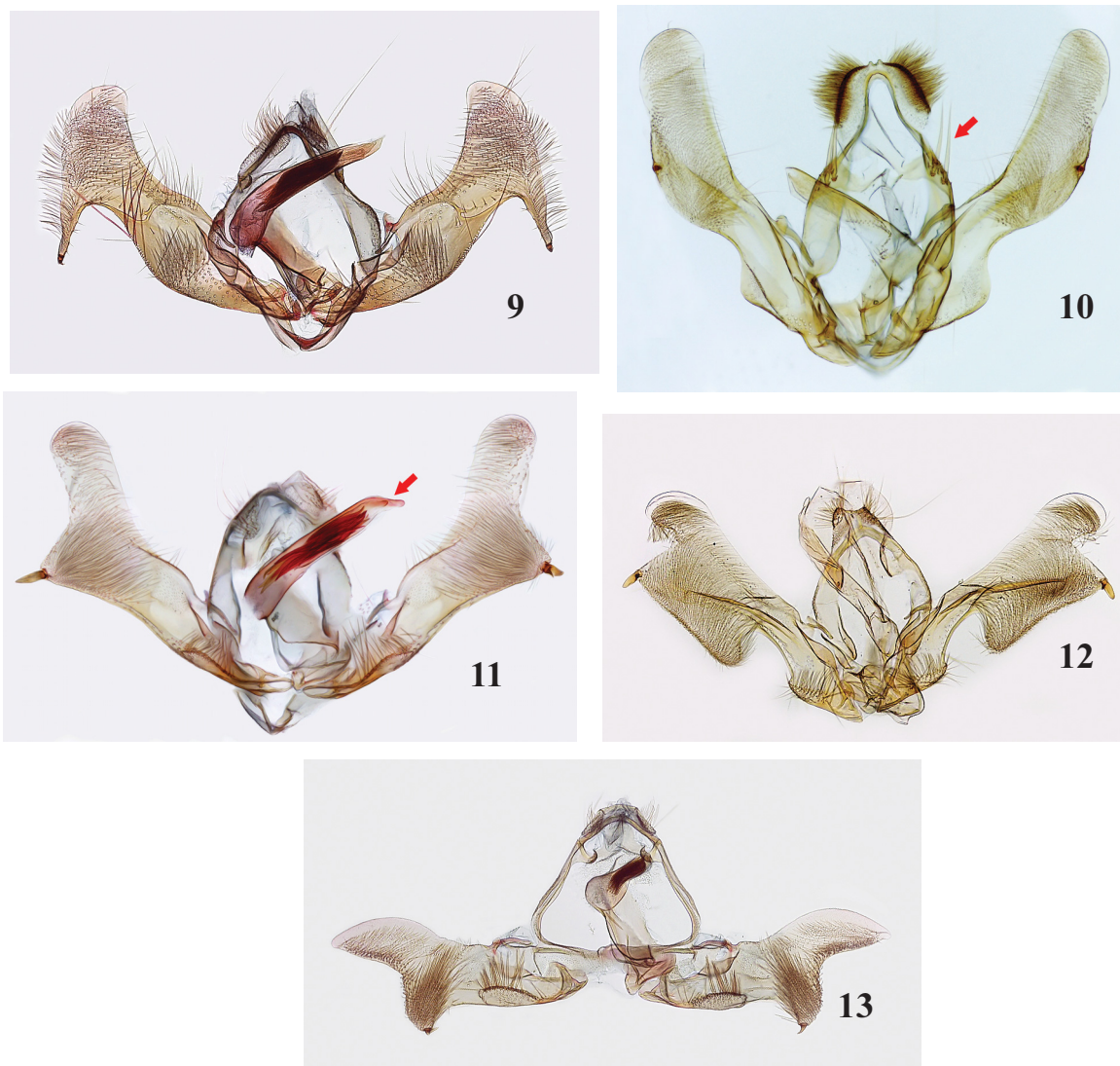
Figs. 3, 4, 10, 15

**Diagnosis.** The male and female genitalia of this species differ from those of other species of *Loboschiza* by a pair of nipple-shaped projections possibly representing uncus and the spiniform setae on the base of gnathos in male, and by a narrow band forming an incomplete ring near the origin of the ductus seminalis in female.

**Description.** Head: Upper frons orange, lower frons yellowish orange, vertex orange; labial palpus porrect, first segment yellowish orange, second segment distally strongly widened, yellowish orange, slightly darker to orange distally, with small blackish patch dorsoapically, third segment small, yellowish orange. Antenna short, not reaching middle of forewing costa, dark brown, dorsobasally with narrow, longitudinal band of yellowish orange scales.

Thorax: Pronotal collar, tegulae, and mesonotum greyish brown mixed with orange; hindlegs unmodified in male. Forewing broad, subtriangular, length 4.9–5.0 mm in male (n = 5) (Fig. 3), 4.9–5.0 mm in female (n = 2) (Fig. 4), termen moderately oblique, costal margin with well developed, small blackish striae; two-toned wing pattern with basal 2/3 with well-defined orange spots and bands on greyish yellow to light brown ground, distal portion with blackish ground color with wide orange sinuous scribbles. Underside greyish brown, with white spots alternating with brown along costa. Hindwing dark brown, paler towards base especially in male, anal margin with row of long, light brown hair tufts. Underside pale brown.

Abdomen: Male genitalia (Fig. 10) with tegumen subovate, apically broadly rounded, moderately sclerotized, lateroapically with dense scale sockets on anterior surface, a pair of nipple-shaped projections possibly representing uncus; socii rather large, distally free, membranous, densely bristled lobes; gnathos with two lateral arms, moderately sclerotized bands, extending from middle of tegumen, with distinct group of moderately long spiniform setae at base; vinculum moderately sclerotized; juxta small; caulis moderately long; phallus moderately long, wide at base and slightly narrowing to apex, nearly straight but ventral surface slightly concave, with dense cornuti sockets; valva moderately sclerotized, simple, sinuate; sacculus rather small, projection in a nearly right angle, with dense patch of scale sockets along ventral margin; neck distinct; cucullus elongate-ovate, distally rounded, densely setose, with small, single thorn from below middle of ventral margin. Female genitalia (Fig 15) with papillae anales with dense setae. Tergum VIII smooth except for lateral triangular extensions with dense microtrichia; sternum VII moderately sclerotized, with moderately dense scale sockets, denser along concave, curved posterior margin; ostium bursae behind posterior margin of sternum VII, sterigma a semicircular ridge with two bands of microtrichia extending from each of its end onto lamella postvaginalis; colliculum just below ostium, a moderately wide and sclerotized irregular ring, narrower anteriorly; ductus bursae as long as corpus bursae, widening towards corpus bursa, with sclerotized, narrow band forming an incomplete ring below origin of ductus seminalis; ductus seminalis arising near middle of ductus bursae; corpus bursae large, ovate, signum a depressed, elongate area of scobination near neck of corpus bursae.



**FIGURES 9–13.** Male genitalia of *Loboschiza* spp. **9.** *L. koenigiana*. **10.** *L. spiniforma*, **n.sp.** (holotype). **11.** *L. bisulca*, **n.sp.** (holotype). **12.** *L. subrectangula*, **n.sp.** (holotype). **13.** *L. lunata*, **n.sp.** (holotype).

**Holotype.** ♂, Thailand, Chanthaburi Prov., Khao Khitchakut N.P., 12°51'04"N, 102°12'10"E, ca. 98 m, 8–9 Feb 2013, N. Pinkaew, np 5658, ♂ genitalia slide NP 1905. Deposited in KKIC.

**Paratypes.** 4♂, 2♀, Thailand, Chanthaburi Prov., Khao Khitchakut N.P., 12°48'37"N, 102°09'11"E, ca. 92 m, 16 Dec 2012, N. Pinkaew, np 5640, ♂ genitalia slide NP 1890. 1♂, 1♀ Nakhon Ratchasima Prov., Sakaerat SERS, 14°29'47"N, 101°54'59"E, ca. 514 m, 27 Apr 2014, N. Pinkaew, np 6975, ♂ genitalia slide NP 2549, 27 Feb 2014, N. Pinkaew, np 6950, ♀ genitalia slide NP 2393. 1♂, Nakhon Nayok Prov., Khao Yai N.P., 14°23'56"N, 101°22'16"E, ca. 786 m, 21 Jan 2010, N. Pinkaew, np 3327, ♂ genitalia slide NP 1335. 1♂, 1♀, Sa Kaeo Prov., Pangsida N.P., 13°59'49"N, 102°12'16"E, ca. 185 m, 4 Jul 2015, N. Pinkaew, np 7793, ♂ genitalia slide NP 2582, N. Pinkaew, np 7795, ♀ genitalia slide NP 2583. Deposited in KKIC and THNHM.

**Etymology.** The specific epithet *spiniforma* refers to the spiniform setae lateromedially on the tegumen.

**Distribution.** Central, Northeast, Eastern Thailand.

***Loboschiza bisulca* Anan and Pinkaew, n. sp.**

Figs. 5, 6, 11, 16

**Diagnosis.** The male genitalia of this species differs from those of other species of *Loboschiza* by a subtriangular, ventral cucullus lobe with a bifurcate thorn, and a phallus with a downwardly bent, dorsoapical, bifid, finger-like projection.

**Description.** Head: Upper frons yellowish orange, lower frons light yellow, vertex light orange mixed with light brown; labial palpus porrect, first segment yellowish orange, second segment distally strongly widened, yellowish orange, slightly darker to orange distally, with small blackish spots dorsomedially, third segment small, yellowish orange. Antenna extending to middle of forewing, dark brown, dorsally with narrow band of yellowish orange scales.

Thorax: Pronotal collar, tegulae and mesonotum light brown mixed with orange; hindlegs with tibia modified in male, with dorsobasally, yellowish white tibial pencil. Forewing broad, subtriangular, length 4.0–4.2 mm in male (n = 4) (Fig. 5), 4.1–4.2 mm in female (n = 3) (Fig. 6), termen slightly oblique, costal margin with well developed, small blackish striae, two-toned wing pattern with basal 3/5 with broad orange bands on light brown ground, distal portion with blackish ground color with wide orange sinuous scribbles, separated from rest of wing by a transverse leaden band. Underside greyish brown, with white spots along costa. Hindwing narrow, subcrescentic, brown, paler towards base especially in male. Underside light brown, paler medially.

Abdomen: Male genitalia (Fig. 11) with tegumen subtriangular, moderately sclerotized, laterally with moderately dense scale sockets, lateroapically with dense scale sockets on anterior surface; uncus absent; socii membranous, rather small, distally free, pendulous bristled lobes; gnathos two moderately sclerotized lateral arms, arising from near middle of tegumen; vinculum moderately sclerotized; juxta moderately large; caulis moderately long; phallus moderately long, slightly downcurved at base but otherwise straight, wide at base and slightly narrowing to downwardly bent, bifid, finger-like apical processes, with dense cornuti; valva moderately sclerotized, deeply bilobed; sacculus hardly projecting, densely setose; cucullus bilobed, densely setose, dorsal lobe elongate-ovate, ventral lobe subtriangular with a large bipronged thorn at apex. Female genitalia (Fig. 16) with papillae anales wide with dense setae. Tergum VIII smooth except for lateral triangular extensions with dense microtrichia; sternum VII moderately sclerotized, with moderately dense scale sockets, denser along concave, curved posterior margin; ostium beyond posterior margin of sternum VII, sterigma a moderately wide U-shaped ridge, with dense microtrichia; colliculum just below ostium, an irregular broad ring, wider anteriorly, moderately sclerotized; ductus bursae shorter than corpus bursae, strongly widened in anterior half, with small sclerite in middle near origin of ductus seminalis; corpus bursae with two small, depressed scobination signa.



**FIGURES 14–16.** Female genitalia of *Loboschiza* spp. **14.** *L. koenigiana*. **15.** *L. spiniforma*, **n.sp.** (paratype). **16.** *L. bisulca*, **n.sp.** (paratype).

**Holotype.** ♂, Thailand, Nakhon Nayok Prov., Khao Yai N.P., 14°21'49"N, 101°24'37"E, ca. 1140 m, 20 Jan 2010, N. Pinkaew, np 3337, ♂ genitalia slide NP 2586. Deposited in KKIC.

**Paratypes.** 3♂, 3♀, Thailand, Nakhon Nayok Prov., Khao Yai N.P., 14°21'49"N, 101°24'37"E, ca. 1140 m, 20 Jan 2010, N. Pinkaew, np 3340, ♂ genitalia slide NP 2587, N. Pinkaew, np 3325, N. Pinkaew, np 3334, ♀ genitalia slide NP 2590, N. Pinkaew, np 3343, 10 Sep 2010, N. Pinkaew, np 4718, ♀ genitalia slide NP 2589. Deposited in KKIC and THNHM.

**Etymology.** The specific epithet *bisulca* refers to the bifid apex of the phallus.

**Distribution.** Central Thailand.

***Loboschiza subrectangula* Anan and Pinkaew, n. sp.**

Figs. 7, 12

**Diagnosis.** Superficially, *L. subrectangula* is nearly indistinguishable from its congeners. However, it can be distinguished by the male genitalia which possesses a large, subrectangular, ventral lobe from the cucullus which is unique in the genus.

**Description.** Head: Upper frons light orange, lower frons yellowish orange; vertex light orange mixed with light brown; labial palpus porrect, first segment yellowish orange, second segment distally strongly widened, yellowish orange, slightly darker orange distally, with small blackish patch dorsomedially, third segment small, yellowish orange. Antenna short, to less than middle of forewing, dark brown, dorsally with narrow band of orange scales basally.

Thorax: Pronotal collar, tegulae and mesonotum greyish brown mixed with orange. Hindlegs modified in male with a group of long, tibial pencil, greyish brown in contrast to a group of dense, blackish tufts basally. Forewing (Fig. 7) broad, subtriangular, length 4.4–4.5 mm in male (n = 2), termen rather straight, costal margin with well developed, small blackish striae; two-toned wing pattern with basal 2/3 with orange bands on greyish brown ground, distal portion with blackish ground color with wide orange sinuous scribbles. Underside greyish brown, with white spots alternating with light brown along costa. Hindwing evenly greyish on both sides.

Abdomen: Male genitalia (Fig. 12) with tegumen subovate with slightly bifid and medially concave apex, moderately sclerotized, dorsolaterally with dense scale sockets on anterior surface; uncus absent; socii membranous, small, bristled lobes; gnathos two lateral arms, moderately sclerotized bands fused with anal tube; vinculum moderately sclerotized; juxta small; caulis rather long; phallus moderately long and wide, base wider and weakly downcurved, with moderately dense cornuti sockets; valva moderately sclerotized, complex; sacculus small, with patch of moderately dense setae, neck very distinct; cucullus large, bilobed, densely setose, with a rounded dorsal lobe, ventral lobe very large, subrectangular, with a bipronged thorn at ventrodistal angle. Female unknown.

**Holotype.** ♂, Thailand, Nakhon Ratchasima Prov., Sakaerat ERS., 14°29'47"N, 101°54'59"E, ca. 514 m, 27 Feb 2014, N. Pinkaew, np 6940, ♂ genitalia slide NP 2383. Deposited in KKIC.

**Paratype.** 1♂, Thailand, Nakhon Ratchasima Prov., Sakaerat ERS., 14°29'47"N, 101°54'59"E, ca. 514 m, 20 Mar 2015, N. Pinkaew, np 7605, ♂ genitalia slide NP 2564. Deposited in KKIC.

**Etymology.** The specific epithet *subrectangula* refers to the shape of the prominent ventral lobe of the cucullus.

**Distribution.** Northeast Thailand.

**Remarks.** Specimens were collected in the dry season in dry evergreen forest of the Sakaerat Environmental Research Station.

***Loboschiza lunata* Anan and Pinkaew, n. sp.**

Figs. 8, 13

**Diagnosis.** The male genitalia of this species are similar to those of *L. martia* in the shape of the cucullus, but they have a curved thorn on the apex of the ventral lobe and subtriangular tegumen rather than an irregular pentagon with definite shoulders as in *L. martia*. Also, whereas the base of the phallus is unmodified in *L. martia*, it is swollen in *L. lunata*.

**Description.** Head: Frons yellowish orange, vertex light orange; labial palpus porrect, first segment light yellow, second segment distally strongly widened, yellowish orange, slightly darker orange distally, with small blackish spots dorsoapically, third segment small, yellowish orange. Antenna short, not reaching middle of forewing, dark brown, dorsally with narrow band of yellowish orange scales.

Thorax: Pronotal collar, tegulae and mesonotum brownish orange; hindlegs unmodified in male. Forewing (Fig. 8) broad, subtrapezoidal, length 4.9–5.0 mm in male (n=2), termen slightly oblique, costal margin with small, blackish striae, bipartite wing pattern with basal 3/5 with narrow and wide orange bands on light brown ground, distal portion with blackish ground color with orange partly sinuous marks, separated from rest of wing by a transverse leaden band. Underside greyish brown, with white spots alternating with brown along costa. Hindwing subtriangular, dark brown, paler towards base and termen. Underside greyish brown.

Abdomen: Male genitalia (Fig. 13) with tegumen subtriangular, moderately sclerotized, lateroapically with dense scale sockets on anterior surface; uncus absent; socii rather small, elongate-ovate flaps, membranous, densely setose; gnathos two lateral arms, moderately sclerotized basally, arising from apical 1/3 of tegumen; vinculum moderately sclerotized; juxta moderately large; caulis rather long; phallus short, straight, swollen at base, with dense cornuti, long as half of phallus; valva moderately sclerotized; sacculus with large, projecting elongate lobe, with dense setae; cucullus bilobed, dorsal portion moderately wide, subcrescentic, apex obtuse, densely setose except along dorsal margin, ventral portion narrowly subtriangular, inwardly curved, densely setose, with a curved thorn at apex. Female unknown.

**Holotype.** ♂, Thailand, Nakhon Si Thammarat Prov., Khao Nan N.P., 08°47'00"N, 99°47'46"E, ca. 125 m, 8 Jun 2008, N. Pinkaew, np 2441, ♂ genitalia slide NP 2584. Deposited in KKIC.

**Paratype.** 1♂, Thailand, Nakhon Si Thammarat Prov., Khao Nan N.P., 08°47'00"N, 99°47'46"E, ca. 125 m, 8 Jun 2008, N. Pinkaew, np 2444, ♂ genitalia slide NP 2585. Deposited in KKIC.

**Etymology.** The specific epithet *lunata* refers to the crescent shape of cucullus.

**Distribution.** Southern Thailand.

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